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USEFUL RECEIPTS.

Chloride of Sodium (Common Salt) in Intermittent Fever.

The most elaborate and carefully prepared paper on this subject is from the pen of Dr. Lattemore, in a late number of the American Journal of Medical Sciences. In this essay Dr. L. details the method pursued by M. Piorry—his extreme tact in detecting enlargement of the spleen—his success in reducing this organ by the use of chloride of soda.—Most of the cases of intermittent fever met with in the Parisian Hospitals are of long standing and imported from Algiers, says Dr. L., and they are always accompanied with enlarged spleens and difficult to cure. "We witnessed," says this writer, "many of the experiments of M. Piorry, and in a great majority of cases the fever yielded to salt quite as readily as to the salts of quinia." M. Piorry's method of administering the chloride of soda is, to give half an ounce in a cup of thin soup during the apyrexia (intermission) and fasting. It generally agrees with the stomach; rarely purges or vomits. Three doses usually suffice to effect a cure.

Court Plaster.

To make this, black silk is strained and brushed over ten or twelve times with the following preparation:—Dissolve half an ounce of balsam of benzoin in six ounces of rectified spirits of wine; and in a separate vessel dissolve one ounce of isinglass in as little water as may be. Strain each solution, mix them, and let the mixture rest, so that any undissolved parts may subside; when the clear liquid is cold it will form a jelly, which must be warmed before it is applied to the silk. When the silk coated with it is quite dry, it must be finished off with a coat of a solution of four ounces of turpentine in six ounces of tincture of benzoin, to prevent its cracking.

Crayons.

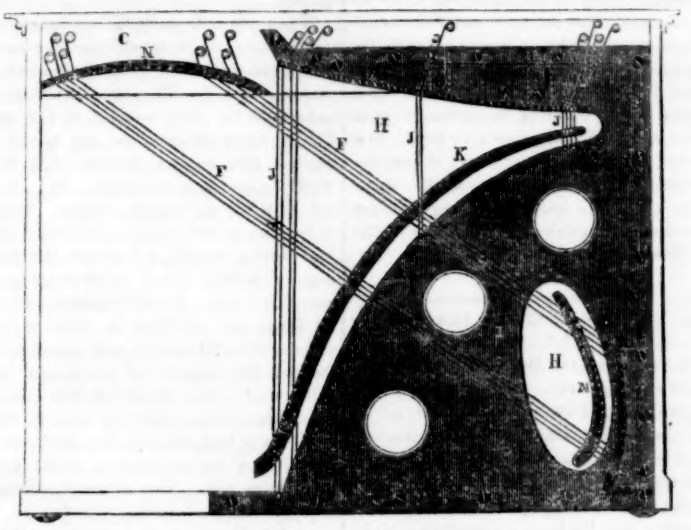
Colored cylinders used for drawing upon paper; they are usually made of a fine pipe-clay, colored with metallic pigments or carmine. Crayons containing plumbago are styled solid lead pencils.

CRAYONS, LITHOGRAPHIC.—Various formulæ have been given for the formation of these crayons. One of these prescribes, white wax four parts; hard tallow soap, shellac, of each two parts; lamp black one part. Another is, dried tallow soap and white wax, each six parts; lamp black one part. This mixture being fused with a gentle heat, is to be cast into moulds for forming crayons of a proper size.

Tunnel through the Alleghanies.

One of the tunnels through the Alleghanies, now constructing on the line of the Pennsylvania Railroad, is to be 3,570 feet in length. Its area, at the widest space within the lines of the masonry, will be about 24 feet, and the spring of the arch will begin 16 feet from the crown of the arch. About 400 men are employed upon it.

IMPROVEMENTS IN UPRIGHT PIANOFORTES.---Fig. 1.



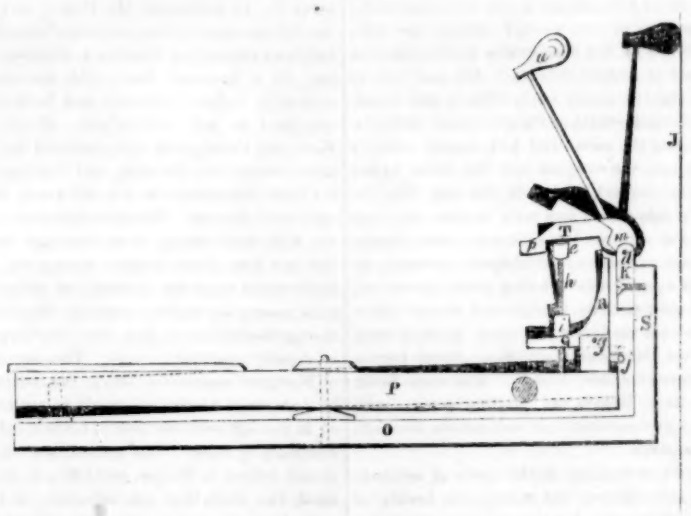
The annexed engravings are views of improvements in Upright Pianofortes, invented by R. E. Letton, of Quincy, Ill., and for which a patent was granted the 5th of last October, (1852). The invention consists in a certain arrangement of the sounding-board, metallic plate, and bridges; also in the "action" or striking part.

Figure 1 is an elevated view of the metallic plate, sounding-board, &c., and fig. 2 is a side elevation of the striking part.

The demand for the first two improvements lay in the fact that, in almost all pianofortes, the upper notes are weak and greatly deficient in fullness of tone. This is owing to the necessary shortness of strings, and the extreme nearness of the bridge to the edge of the sounding-board, by which each string becomes shorter and shorter, consequently has less and less wiry and thin. The fact that the sounding-board can be more easily set in motion near its centre, than at the edge, can be proved by a common illustration: thus, place the two ends of a board on blocks, the nearer to the centre a person stands on the board, the more easily is it sprung. The same difficulty takes place in the bass strings, but the great length of these strings, and the consequent strong vibration, overcomes the lack in the sounding-board.

All persons acquainted with upright pianofortes, know their want of freedom to the touch; a performer is not able to play with the same expression as on the square or grand piano—it is not so sensitive to the light touch owing to the complicated combinations in the actions in order to reach the upper end of the strings. This improvement consists in constructing a simple and free action, and placing the strings within its reach, instead of additional machinery to reach the strings. This is accomplished by the bass or long oblique strings, F F, which are attached to or pass round pins in the metal plate or bracket, L, which is secured in nearly a vertical position in front of the metallic plate at the lower right hand corner, fig. 1; from thence they pass over the bridge, M, which rests on the sounding-board (an opening being made in the metallic plate to admit the bridge), from thence, crossing in front of the strings, J J, they pass over a curved bridge, N, which is firmly secured in a nearly horizontal position to the top timber or tuning block, C, terminating in the upper left-hand corner of the case. By this arrangement the greatest possible length of string is obtained. The bridge, N, is brought a little lower than the end of the metallic plate, in order to bring the long strings within reach of the action. it being necessary to strike the string within a certain distance of the end, to produce the greatest tone.

Figure 2.



In figure 2, the action is all attached to the key-board, O, where the end of the key-board and one of the strings is shown, and that will be sufficient to explain the operation of the hammers on all the strings. P is the key; Q R is a bent lever, termed the jack, which hangs on a pivot, *g*; in a small block upon the back of the key, an upright wire, *h*, is secured in the top of the key, and passes freely through the arm, Q, of the bent lever. This wire is screwed and furnished above the arm, Q, with a button or nut of leather or other material, *i*, which is adjustable at various heights to regulate the height of the end of the said arm, which is thrown up against it by a spring, J. placed between it and the key. By thus adjusting the arm Q, the arm R is adjusted to bring its point or upper end to any required position. Attached to the back edge of the key-board, O, there is a perpendicular board, S, running the entire length of the key-board; to this board all the blocks, K, which carry the hammer butts, T, are attached. The hammer butt hangs on a pivot, *d*, and carries the hammer, *u*, in the usual way. When the key has been depressed, the hammer is then thrown back immediately after striking, by the weight of the butt, which is extended in the form of a low arm. This part of the butt, T, rests, when the key is left free, upon a button, *e*, at the upper end of the wire, *h*, and in that position it is represented in the figure. This button, *e*, is adjustable on a screw on the wire, to regulate the fall of the hammer. On the under-side of the arm, T, there is a small cushioned block or projection, *p*, the office of which is to fall on the button, *e*, immediately after the hammer has struck and while the key is retained; the button, *e*, thus acts as a stop, and prevents the entire descent of the hammer, by only allowing it to fall back a short distance, enabling the operator to repeat a note a number of times in rapid succession. The button, *e*, by being adjusted at a proper height on the wire, *h*, is also intended to leave the point of the arm, R, of the jack free of the butt when the key is free. The key is shown in shaded lines as depressed, the hammer being in the act of striking, and just about to fall back. It will be understood, by referring to the shaded lines, that the point of the key lever, in throwing up the hammer, arrives at the vertex of the shoulder, *m*, and then passes it, leaving the hammer free to fall back and bring its cushioned block, *p*, to the button, O, which it does instantaneously, without perceptibly displacing the key lever, thereby rendering the notes sure and quick.

The frame is made in a substantial manner, with oblique braces and oblique iron bars, to resist the opposite strain of the long or bass strings.

About the upright position of the pianoforte it is useless to say anything, for in this compact form it occupies much less space than in any other position, and therefore is a more convenient, and more graceful article of furniture.

More information may be obtained by letter addressed to the patentee.

Gold at the Mint.

From the first to the 15th of December, the receipts of gold at the United States Mint in Philadelphia, were $2,570,00—a large amount for the period, though not up to the unprecedented deposit of November.

Mr. Hind, of the Observatory of Regent's Park, London, has discovered another new planet, situated between the two bright stars in the horns of Taurus.

MISCELLANEOUS.

[Reported expressly for the Scientific American]

Lectures on Chemistry.—No. 2.

[An abstract of a Lecture on Water, delivered before the Mechanics' Institute, at Cincinnati, Ohio, by Prof. Chas. W. Wright]

Water is composed of oxygen and hydrogen combined, in the proportions of eight parts of the former to one of the latter, by weight, and by volume, of two of hydrogen and one of oxygen, or in 100 parts of water there are 11·1 of hydrogen united to 88·9 of oxygen.

Water plays the part of a base towards acids, and of an acid towards bases: thus, when it combines with sulphuric acid it is termed the sulphate of water, and when it unites with lime the compound takes the name of the hydrate of lime. By most chemists, water is looked upon as a metallic oxide or rust, hydrogen being considered a metal; and Dr. Kane has shown that there is the closest similarity between the oxydes of zinc and copper, and water, which is the oxyde of the metal hydrogen.

In some quantities, water is transparent and colorless, but in large volumes it is blue by reflected, and green by transmitted light. The solvent powers of water exceed that of any other liquid. As a general thing, this solvent power is increased by heat, as regards solids, but the reverse is the case as regards gases. Under great pressure, water will dissolve bodies, as glass, which are insoluble in it at a moderate heat and pressure. Water, like most other bodies, contracts on the abstraction of heat; but when its temperature is reduced to 39°, the loss of heat, instead of causing contraction, increases its volume, and hence, at 39°, water is at its point of maximum density, and the addition or abstraction of heat will augment its volume. From 39° to many degrees below the freezing point of water, it expands, and hence ice is of less specific gravity than water, and floats upon it. The importance of this, in preventing the consolidation of large bodies of water, is evident. At 32°, if water be agitated, it freezes, but if it be under great pressure, which resists its expansion, it will not consolidate at that degree of temperature, and the same is true in regard to other substances that expand in congealing. Water, in the act of freezing, parts with all matter which it holds in solution and suspension, and hence the water of the ocean is rendered sweet and drinkable by being frozen. On the same principle, ice, which is cut from pools that are stagnant in summer, is fit for domestic use. Ice which contains air and other impurities, mechanically suspended in it, thaws much sooner than that which is free from such contamination. In passing into the condition of water, ice conceals, or renders latent, 140° of heat, and water, in the act of freezing, imparts the same quantity of heat to surrounding bodies. Hence, freezing is a heating process, and thawing a cooling one; for the same reason large masses of snow and ice are never melted suddenly, and inundations are less frequent than they otherwise would be.

When the mercury in the barometer stands at 30 inches, water boils at 212° in a metallic vessel, but in a smooth glass vessel it requires 214° to make water boil. Water, free from air and other impurities, does not boil at 212°, but when it reaches a temperature of 270° it explodes violently. This can best be shown by melting ice under the surface of oil, which prevents the absorption of air, when at 270° it explodes. A diminution of atmospheric pressure reduces the boiling point, and if it be increased the reverse is the case. Water evaporates at all temperatures, even in the condition of ice it assumes the gaseous form, without passing into the intermediate condition of a liquid. This is seen when articles of clothing are hung out to dry in winter, when they freeze and dry without thawing, and the same thing is seen when the mud in the streets freezes and dries, although the temperature may remain below 32°. In boiling and passing into the condition of steam, water takes up and conceals 1000° of heat; and when this fluid is boiled violently, it is no hotter than when it boils slowly, from the fact of the additional heat being carried off by the steam, and the temperature of the water, under ordinary atmospheric pressure never rises higher than 212°. The knowledge of this fact is of great importance in domestic economy; for water, boiling gently, will accomplish as much in culinary operations as when the ebullition is violent. The latent heat carried off by steam has much to do with regulating the temperature of the earth, and also that of the bodies of animals, for the same law holds at low as well as at high temperatures. At 212° the elastic force of steam is equal to a pressure of one atmosphere; at 250° the pressure is doubled; and at a temperature of 500° we have a pressure equal to 50 atmospheres. Thus we see, contrary to the common impression, it does not require twice the amount of heat to double the pressure. The action of water on metallic vessels is not a little singular: thus, if the water be pure, its action is more corrosive to lead and zinc than if it have mineral matter in solution. The water of the ocean, at great depths, has a different action upon metals from what it has at the surface. At the surface, according to the experiments of Dr. A. A. Hayes, metals are converted into oxydes and chlorides, but at great depths the same metals are converted into the sulphurets.

The Poetry of Mechanism.

On the Evening of the 14th inst. the Rev. S. Osgood delivered a most interesting lecture before the Mechanic's Society, the subject of which was. "The Poetry of Mechanism, or the Future of Useful arts:—"

When Franklin, said the lecturer, upon seeing some flies restored to life that had for some months been immersed in wine declared that he would gladly be drowned in the same manner, if after the lapse of a hundred years he could be resuscitated, and be allowed to see the state of things in this country at that time, he little thought how far the reality would surpass his most sanguine expectations. So varied and startling have been the events of the last century, that its sober history, if stated befoehand, as prophecy, would have been deemed about as probable as some Oriental legend or narcotic dream. Before the gateway of that palace of historical wonders into which Christendom for three centuries has been passing, and where as we press on, each year is adding some new marvel, and prompting the question, "What next? what next?"— as the veil before an unexplored recess is beginning to quiver, before that gateway stand three forms who have given the chief impulses to all modern history. Central stands a stout figure that cannot easily be mistaken; in his hands he holds an open Bible, and at his feet, among a pile of controversial folios, may be seen a scroll bearing the title, "Address to the Magistrates of Germany in behalf of Public Schools." On one side of him stands a manly form, with a face blending the refinement of the gentleman with the daring of the sailor, and you hardly need to look upon the compass and the helm before him to connect him with the sea. On the other side stands one with far less imposing air, yet with the inbred dignity ever characteristic of earnest intelligent industry, he leans upon a rude printing press, as seeking rest after anxious thought and severe toil.—These are the three, you know them at once, Luther, Colombus, Guttenberg; three heroes, arbiters of modern history. The open Bible, the New World, the printing press; with these powers what vast revolutions associate themselves.

Let us select any master piece of mechanism, and consider, not merely the beauty of its workmanship, but the exquisite adjustment of its various parts and movements. Let it be a printing press or a spinning frame, a power loom or a steam engine, an organ or a telescope. Consider the number of materials and forces harmoniously combined—recall the history of each material and the origin of each force, and straightway every law of nature, faculty of man, gift of Providence, associated itself in some way with the construction. Nay, every piece of wrought iron was, to a thoughtful mind, a heroic poem, for it told the story of an art identical with the progress of civilization. The telescope! what power of mind, what skill of the hand, what use of life, what attribute of God, was not illustrated by its structure and application? The most common mechanism, would tell, if we listened, a chapter of romance. Enter the realm of the beautiful arts, and did we not see the mechanic as virtually translating its master pieces into general language, and by correct copies bringing the most beautiful forms of art within the means of many. In music, when hearing the compositions of Thalberg, or an oratorio of Haydn, we should not forget that Shoedek invented the piano, and Forner gave the organ its compass and swell. Our enjoyments of scenery, too, were in a great part owing to the iron-horse and iron-oarsman. The beauty of mechanical art interpreted the beauty of natural mechanism, and here a realm opened into which we could not even glance.

When we look back to the invention of printing by Guttenberg, and see what has been accomplished since; "what are the next four centuries to do?" The facts of history gave romance to the pages opening in the future. The common-places of our day would have startled our Puritan fathers. Old Merlin would be found a tame plodder, when compared with the philosophic Morse. Mysteries opened all around, in iron, air, water, fire.—The modern Aladdin had rubbed the magical ring, and a Titan power knelt at his feet and waited his word; he had lighted his wonderful lamp, and lo! from its flame a power arose that reared palaces, cast mountains into the sea, and mocked at winds and waves. Who would dare to predict the future—to speak what things should be done in the air, or on sea or land, or under the earth—to conjecture how far mechanism would borrow mind from man. The future of mechanism was intimately connected with the physical, mental, and moral destiny of man. All history showed that man had progress in proportion to the power of the implements within his reach. That a great work was to be done for the welfare of man, was evident from what had been done. The wealth of England came from her manufactures, and Watt and Arkwright, more than Wellington and Blucher, gave her the palm in the strife with the enemy. Our Fulton gave this nation a greater source of wealth than all the mines of California. The lecturer proceeded to show that the mind of man would share in the power destined to mechanic art. That it would ameliorate his condition—our men would toil and feel no pain. Politicians were in the habit of speaking a great deal about maintaining the Union; but he would say a word for the mechanic. He believed the mechanic had so wired and clamped it together, that politicians would find hard to dissever it. In conclusion, Mr. Osgood said that the different lines of discoveries and inventions had been converging towards a common centre. In a thousand ways, the movements started by Luther, Columbus, and Guttenberg combined in new adaptations. Arkwright, Watt, and Fulton, met and combined as they never dreamt of; Franklin and Galileo united their discoveries in the telegraph years after their decease. When the arts and sciences, with their strong arms and sage heads, met in a true order, central among the vast hosts would stand the symbols of religion—chief among the waving pennons should float the spotless banner of Him who was the power of peace and king of men. The invention of Watt, the analyses of Davy, the constructive genius of Angelo, all should be represented in concert with the faith of Luther and the humanity of Penn. Thus guided, mechanism would follow a Divine mandate; it would build the walls that are salvation, and the gates that are praise. The strong hand outstretched in power should be uplifted in devotion and opened in charity. The speaker sat down amid loud applause, and well he deserved it. He takes true and noble views of the benefits conferred upon man by inventors and discoverers.

First Locomotive West of the Mississippi.

On the 2nd inst., the first scream of the iron horse was heard on the west of the Mississippi in St. Louis.

The Pacific Railroad has been commenced, and has so far progressed that the locomotive, with burden and freight trains, is running upon it. True, only a few miles are yet in use, but who can predict how long or short the period when the locomotive will start from the Mississippi and terminate its flight on the shores of the Pacific.

The New Crystal Palace.

Our friends the Directors of the New York Crystal Palace, who have so ostentatiously put themselves forward as the sole Representatives of American Industry, appear to have but little suitable notions of their heavy responsibility. We have made a visit to Reservoir Square, and were disappointed at beholding the building in so backward a state, nor does there seem to be much inclination to carry it on with a proper vigor. Only a few columns have been reared, and there are both a numerical deficiency of workmen and very little material on the ground. We would advise Mr. Sedgwick and his coadjutors to evince more energy, or else we are confident the Crystal Palace will never be completed at the specified time. The frost has already set in and from now until the following spring not much can be done. How long, we would ask Mr. Sedgwick, will there then be to erect the building? Not two months, and not only to erect it, but to have every thing prepared and arranged for exhibition. According to their present manner of working, they will require at least twelve months instead of until May, to get it complete. Upon the whole we are fearful that the affair will turn out a failure; nothing has been done on a scale commensurate with the proposed objects—The building, with regard to size, will evidently be ridiculously small, and if only one half of the quantity of articles are sent that have been expected, there will not be room for them. A similar petty spirit appears to guide the Directors in other matters, and already it has set itself up antagonistic to the interests of private individuals in the city. Instead of being what it was proposed to be—an Industrial Exhibition similar to that in London, for the encouragement of manufactures and trade, it is diminishing already into a mercenary speculation, and the objects lost in gratifying the whims and pandering to the views of an interested clique. Unless some change is made, we doubt much whether it will not turn out a failure, for at present there is not that public spirit exhibited by the Directors which we had hoped to have seen evinced. Our character as a nation depends upon their management of the concern.

The First Prize.

We have received the following letter from the party who gained the first prize for the largest list of subscribers, and are rejoiced to find that a hard-working mechanic has been the lucky man. It will be seen from his letter that he has not lost any time while canvassing for us; and we will undertake to say the time he has spent in reading the Scientific American has not been lost either. If our subscribers would only exert themselves a little in diffusing a knowledge of our paper among their acquaintance, we have no doubt that the circulation would be immensely increased. It is evident from what our correspondent says, that its advantages are immediately felt and perceived by those to whom it is made known:—

"MESSRS. MUNN & Co.—Your favor of the 13th inst. was gratefully received, containing the announcement that the first prize for the largest list of subscribers was awarded to me; it was somewhat unexpected, though I fondly hoped to be the lucky man. The Scientific American is truly a valuable source of knowledge—the reading of which commends it to every intelligent man, and I found that it required no extraordinary gift of gab to convince those who would give it their attention. I shall endeavor, wherever I may be located, to introduce it among my acquaintance, and to extend its patronage. As you wish me to indicate my preference either for the Pitcher or the money, I would state that I am a mechanic, dependent upon my daily toil for a livelihood—and you are aware that mechanics' means, at best, are small—and therefore choose the money. I may as well add that I obtained my subscribers without losing any time from my business. Permit me to thank you for your promptness and gentlemanly attention to myself although to you a stranger.

JOHN MARSTON.

Saratoga Springs, N. Y., Dec. 16, 1852.

Machinery and Tools as they are.—The Steam Engine.

(Continued from page 107.)

Steam Boilers—To a person unaccustomed to consider the subject, it may appear, at first sight, a matter of small moment as to the form in which a steam boiler should be made, but when it is remembered that a large manufacturing firm will expend several thousand dollars for fuel in the course of a year, or that a large steamship may require a thousand tons of coal in the duration of a voyage, it is evident that a strict attention to economy in this matter is very requisite. The question, therefore, is—how can fuel be best saved? a problem to be solved by attention to two circumstances, namely, the generation of steam in the boiler and its subsequent use in the engine. The former branch of economy is dependent upon two facts,—the evolution of heat by the combustion of the fuel in the furnace, and the subsequent absorption of this heat by the water. Notwithstanding the progress of steam machinery and the vast practice which many engineers have possessed, it is certain that there is no precise theory for the steam-boiler, from which all the necessary data can be derived for the construction of a boiler of any given evaporating power. The greater part of the rules followed by boiler makers are founded on the practice of their predecessors, and as they generally make a boiler larger than necessary, the chief requisite, a sufficient supply of steam is easily obtained, although often at an unnecessary expenditure of fuel. In discussing this subject we shall begin with marine boilers: these have, of late years, undergone considerable change as to form, which, in this country has been induced by the desire to use anthracite coal instead of wood for the consumption of river and lake steamers. A similar revolution has been effected in the boilers of European vessels, caused by the desire to use steam of a higher pressure, and to diminish the space occupied by this indispensable adjunct to the engine, and also to lessen the weight. All these improvements have tended to discard the use of rectangular flues, and to introduce the employment of tubes, sometimes of small diameter, while in other instances a few tubes of larger diameter, and made of boiler-plate, are used instead. The boilers of our river vessels are generally cylindrical, except the part for the furnaces, two rows of large boiler plate tubes convey the heat through the water to the further end of the boiler, thence it returns through one or two rows of larger tubes to the front of the boiler, and so up the chimney. In other cases two boilers are placed together, fore-and-aft, and one chimney being made to serve for them both, the heat is re-conducted from the front by an additional row of tubes. With respect to the number of the latter, we will remark that the main or lower ones are generally five in number for each furnace, being arranged to suit the cylindrical shape of the boiler, the upper or return tubes are generally placed five in a row.

There is another variety of the tubular boiler, more especially adapted for sea-vessels because, although by no means so strong as the one we have just alluded to, it is better adapted for placing below deck, as it approaches to a rectangular shape, the top part, however, being generally more or less arched, in order to gain additional strength. In boilers of this description it is usual to employ a considerable number of small tubes, which are from two to three inches in diameter. These tubes are sometimes horizontal and frequently vertical—many of our largest steamers employing boilers of the latter kind, some of which have given extremely satisfactory results as respects the weight of water evaporated by one pound of coal. This, in boilers of the ordinary construction varies from 8 to 10 lbs., but in some of these latter it amounts to 12·9 lbs., which may be attributed to slow combustion combined with the mode of arranging the flues and tubes. In those boilers which have horizontal tubes, and most are of this sort, the heated air can either pass directly through them to the chimney, or if one large passage be used for the main flue, the tubes are so disposed as to return the hot air to the front of the boiler, whence it passes to the chimney. The following particulars of a boiler with horizontal tubes, and intended for a low-pressure engine, will give an idea of the present state of this branch of the Steam Engine. The cylinders being 61½ inches diameter, and 4 feet 6 inches length of stroke, the weight of the boilers exclusive of water, was 45 tons, the tubes, which consisted of iron were 3 inches diameter and 6 feet long; the grate-bar surface was 85 square inches per horse-power, the total tube and flue surface 16 square feet per horse-power.

Of the rectangular flue boiler, formerly placed in steamers, we will say nothing, as the use of it is almost entirely abandoned.

The wagon boiler for stationary engines has, in a similar manner, sunk in estimation, being supplanted by those of a cylindrical shape, but whatever the form may be, attention to certain principles is requisite to insure a satisfactory result. Locomotive engineers have almost totally expunged the term horse-power from their nomenclature, but as it is still retained in other branches of steam machinery, it is necessary for the boiler-maker to know its import as respects his business; this is generally defined to be one cubic foot of water evaporated per hour, although, in fact, the power developed by this quantity is much greater in all modern engines. The necessity of "hard firing" will be avoided by the experienced maker, who, aware of the consequent injury resulting from this practice will take care to allow sufficient fire surface. A cylindrical boiler, with an internal flue, is very frequently used, and in the Cornish variety the fire-grate is formed in the entrance of the latter. Plain cylindrical boilers, without any inside flue and enclosed by brick-work, in which the furnace and flues are built, are extensively manufactured. In all these sorts of boilers an excessive length is useless, but the quality of the fuel materially influences the ratio which should exist between the diameter and the length. A cylindrical boiler with double internal flues and furnaces has met with considerable success.

To enumerate all the different varieties of boilers is not our intention,—before closing, however, we will mention that species which has, perhaps, exercised more ingenuity than any other—namely, that in which the water is enclosed in tubes and surrounded by the flame and hot air; doubtless no boiler is better adapted for generating high-pressure steam with rapidity, but its glaring deficiency, as regards safety and economy, are well known. Respecting the locomotive boiler there is little to be said, as it has remained nearly similar in form for many years. The only modification of note is in its being often made of an elliptical shape instead of cylindrical, thus affording a more powerful boiler without detracting from its safety.

[For the Scientific American.]

Speaking through Tubes.

Noticing in this week's number of the Scientific American an article on Acoustic Telegraphs, I take the liberty of pointing out to you some experiments made by Biot, in one of the pipes of the water works in Paris, the distance being 951 metres (over 3,000 feet). The principal results of these experiments were:—

1st, The time taken in asking a question, and receiving an answer, was 5″·58, during which the sound of the voice had been propagated twice through the length of the pipe or over 6,000 feet.

2nd. The softest whisper which could possibly be articulated, was distinctly understood.

3rd. Low and acute sounds, as well as loud and soft ones, were propagated with equal velocity.

The bore of the pipe is not given, but from the length of the pipe, I suspect that it was probably one of the mains from the distributing reservoir, which, if I recollect right, are not less than twelve inches, perhaps more.

The experiments were made, not only with the voice, but by firing pistols, playing the flute, &c. But it was found necessary to make the experiments during the greatest stillness of the night, because in the day time, in such a large city, the atmosphere is filled with such confusion of various sounds, and the ground so much jarred by carriage wheels and other causes of constant friction and percussions that metallic pipes of such size, are affected by vibration, and the column of air within was at times so filled with confused noises, as to render inaudible even a loud call. This, however, would not be the case in small gutta percha pipes. C. S. Quilliard.

Rondout, Dec. 11th, 1852.

Deterioration of Soils—Agricultural Report of Ohio.

We are indebted to the Rev. C. Springer, of Meadow Farm, Ohio, for the Agricultural Report of Ohio for 1851, in which we find much that is valuable to the Agriculturist. We select the following from it, which touches the question of the "rotation of forest trees," published on page 302 of our last volume.

In a state of nature, soils do not deteriorate, but are maintained in a state of uniform or increasing richness.

The trees and plants of spontaneous growth, are of various kinds. Each takes certain elements from the soil, and from the air, the rain, and dew; but the decay of the various parts of the trees and plants, and the reliquiæ of the various animated beings that subsist on animal life, restore to the soil those elements that had been taken from it, except the small quantity removed by the washing action of water—and even this is compensated on the hills by the washing away of the surface soil, and exposing fresh mineral matter to decomposition—and on the low grounds by their receiving the exhausted materials washed from the higher.

Trees draw their mineral elements from a greater depth than the roots of smaller plants, and by their decaying leaves, furnish both organic and inorganic food to themselves, as well as to the smaller plants beneath them.

The excrementitious parts of one plant serve as food to others, so that certain associations of plants and trees are always found, in a state of nature, to characterise certain kinds of soil.

There is a natural rotation of timber growth, so that as soils become more or less loaded with excrementitious matter, so as to be no longer capable of producing a vigorous growth of the same trees and plants, another growth of different plants and trees succeeds.

This order of succession has been partially traced by Rev. C. Springer, but many and long continued observations will be necessary to trace out the natural rotations of the different kinds of timber, on the different kinds of soils. The kinds of rotation best for some of the annual plants raised for the food of man and animals, on some kinds of soils have been ascertained, but little is known of the general laws that may and ought to be ascertained.

Under culture, soils deteriorate unless they are regularly manured. The removal of any crop, natural or artificial, removes elements that must be restored, in order that its fertility should not be impaired. Mineral acids, alkaline earths, silica in a soluble state, chlorine, iron, &c., are removed, equal in weight to the ash that would be obtained by burning the plants removed. Most of these elements exist in a very minute proportion in the soil in a state to enable the roots to absorb, and plants to assimilate them, so that continued cropping, without returning any thing, will soon exhaust one or more of these elements, and the land becomes poor, and must be manured with something to supply the lacking elements—or it must be left at rest in fallow, as it is called, to give time for more of the mineral elements to be liberated, by the gradual decomposition of the particles of minerals in the soil.

Crops removed from the ground carry away not only a large amount of vegetable matter, but also those mineral materials taken up by plants, small in amount, it is true, but indispensable to the perfection of the plants raised.

The straw, stalks, and leaves of the plants, if returned, restore in part the waste; but still, the phosphates which enter in large proportion in the mineral elements of the seeds, are found in small proportions in the other parts of the plants, and the soil becomes gradually impoverished of the elements which are small in amount in all soils, but which are indispensable to the growth and perfection of the seeds of plants. Soils may be and frequently are capable of producing a rank growth of straw, which produce a small yield of grain. Plants will not produce more seeds than they can perfect.

Of the exact composition of the soils of Ohio, little is known, as few analyses have been made. Of the exact composition of the various grains, plants, and their different parts, as well as vegetables, comparatively little is known; but the relations of the plants and the soil on which they grow, and what and how much is taken from the soil by these plants in each stage of their growth, and how much is removed by our mode of culture, are important facts to be known to the farmer.

It is not mere cropping alone with grain, that causes a deterioration in our soils. The flesh, wool, hair, horns, bones, butter, cheese, produced by grazing and marketing our farm products, carry away large quantities of elements from the soil that impoverish it, and diminish its productiveness. The results of this system are now beginning to be felt as much in the dairying, grazing, and sheep farms of Ohio, as where grain has long been raised. The mineral elements removed in the numerous agricultural products are more or less concentrated in cities and villages, where they are permitted to be lost, or they are sent to far distant markets, where they are lost for ever.

The Sphinx.

What the Egyptians signified by the symbolical figure, seems not to be exactly decided. I think it was the type of womanhood, in which power is engrafted on beauty and gentleness. This they represented by a woman's face, neck, and bosom, terminating in the body of a lioness, not in fierce or violent action, but in eternal repose. This is the nature of the passive principle, which receives within itself the germs of life, and quickens and brings them to perfection without any external manifestation of energy. Possibly, also, the Egyptians meant to insinuate that though the female sex is placed as our companion upon earth, it is never understood by us, but will remain, like the sphinx, an enigma to the day of doom. However this may be, I take it for granted that the approximation of sphinx and pyramids was not altogether accidental. The stranger and traveller who approach might learn from the mystic figure beneath the rocks, that around him was all symbol and allegory, and that if he could not read the riddle of its existence, he could scarcely expect to interpret the most abstruse of all symbols on the sacred mount. In all ages there has been an esoteric philosophy, a doctrine and language confined to the few, and even now, they who as travellers journey over the surface of the earth, must veil a portion of their discoveries behind an obscure terminology. When perfect, the sphinx, in all likelihood, formed the crown of Egyptian art. There is something inexpressibly majestic in the dusky head, suggesting the idea of a buried goddess, emerging from beneath the sands; and if we contemplate the outline of the features, and restore what centuries have mutilated and marred, we shall probably have a perfect type of the beautiful as it existed in the mind of the Egyptians.—[J. A. St. John.

Cast-Iron Pavements &c.

The citizens of Boston are real utilitarians, and possess more municipal enterprise than those of any other city in our union. They have an electric fire telegraph for the whole city, which has been in operation for at least a year, and now they are laying down cast-iron pavements.

We understand that the people of Boston have adopted the plan of sweeping and cleaning the streets during the night, and that the plan works admirably. We recommended the adoption of this plan to our citizens two or three years ago, also repairing the streets during the night, but our wise gothamites will not be easily made to adopt such reasonable city reforms. We are glad to know that one city has.

The Circleville Watchman (Ohio,) says that John Brotherlin, Esq., of that place, has constructed a tea kettle made of copper, all complete and entire, and which weighs less than the twelfth part of a cent. This is a triumph of neat-handed workmanship.

NEW INVENTIONS.

Spike-Making Machine.

A machine of the above description has been lately invented by H. B. George, of Nashua, N. H., who has taken measure to secure a patent. It consists of a pair of jaws furnished with a knife, for cutting the heated bar of iron to a proper size, the distance for inserting the bar being regulated by a stop, which is attached by a pivot to the table or platform, on which the whole apparatus rests. These jaws are curved, so that when the front ends are open the inner ones are closed, and vice versa. To operate them a crank is turned, which moves back and forth by means of a slide and toggle-joint, an action block connected with the jaws and also with the header. The action block, when drawn back its full distance, allows two springs attached to the table to throw inwards the inner ends of the jaws, and consequently to distend the outer ends, the bar is then inserted, and the movement of the crank being reversed, the action block is forced forwards and opens the inner ends of the jaws, and closes the outer ones. The header, which consists of a vibrating arm, is also moved forward at the same time, and forcing aside the stop forms the head of the spike by compressing the end of the iron bar against the inner side of the jaws in a small recess. While the jaws are closing the cutting edge of the knife, which works on a pivot on the upper surface of one of the saws, is moving outward, and coming in contact with the bar, cuts it off with a bevel. On reversing the movement, the action block is drawn back, the jaws are again opened and the spike now complete, falls out from between them.

Plastering Machine.

A machine for the purpose of superseding manual labor in the operation of plastering walls, has been invented by Isaac Hussey, of Harveysburgh, Ohio, who has taken measures to secure a patent. It consists of a movable frame upon rollers that can be adjusted to suit any height, and of a smaller frame sliding within it. The latter serves to support a mortar box containing the trowel, which is raised and lowered by means of a drum and endless chain. When in operation the trowel is supplied with mortar by a rod and follower, which are worked by a lever, the quantity being regulated or shut off, as required, by a slide that covers the opening in the box. For plastering ceiling it is only requisite to raise the mortar box to the top of the frame, and for side walls it is adjusted accordingly by turning it to a proper position. For this last-named operation the box is shifted by the sliding frame, which is moved back and forth for that purpose by means of the already-mentioned lever. There are also various cords and pulleys attached to the machine for facilitating the operations of the different parts, which are included in the invention and form a part of it.

Improved Clover Thresher.

In order to obviate the inconvenience at present experienced in threshing clover and other small seed, a new arrangement of the machine has been invented by Sandford Mason and Seth M. Eastman, of Millport, N. Y., who have taken measures to secure a patent. It consists in employing a cylinder with projections or teeth on its periphery, and two additional sets of teeth, one above fixed to the frame, and the other below on a fast bed; the former are used for threshing the straw, and are of a shape corresponding to that object; the latter are made concave, so that the projections on the cylinder fit into their recess, and thus act as a rasp, by which the seed are cleaned from the heads.

Improved Straw Cutter.

David and Lyman Clinton, of North Haven, Ct., have taken measures to secure a patent for an improved Straw Cutter Cylinder. The improvement consists in attaching a wrought-iron shaft to the cast-iron cylinder holding the cutters; this latter may be either cast around the former or cast separate from it, and afterwards secured by pins. The object proposed is to render the cylinder more durable, as cast shafts, which is the ordinary method generally break at the points where the knives are attached to the flanges.

Coupling Shafts and Axles.

A very ingenious contrivance for the above purpose has been invented by Safford E. Sturtevant, of Hartford, Vt., who has taken measures to secure a patent. It consists in securing the shafts of vehicles to the axle or the axle to the shafts, by means of an eye or collar with taper or conical ends, which fit in sockets attached to the shafts. A screw-bolt is inserted longitudinally through the eye or collar and the sockets to keep the ends firmly secured. To obviate any inconvenience from the wearing of the eye or collar, so that the ends would not fit tight, the shanks in which the sockets are sunk, can be brought nearer together by means of a nut on the bolt. The apparatus, although simple, will be found very efficient for the intended purposes, and it is a useful improvement on the ordinary method of uniting together the axle and shaft.

Counterfeit Coin Detector.

Harry G. Robinson, of Schuylkill Haven, Pa., has taken measures to secure a patent for an improved Coin Detector, which, from its portability, can likewise be used as a receptacle for coins and bank bills, thus superseding the employment of a port-monnaie. It consists of an outer cylindrical case, containing a likewise cylindrical gauge box, which is fitted with an aperture at one end of the proper size, to receive a genuine coin, so that if the counterfeit be larger it cannot pass through. For testing by weight, the outer case is made to serve as a balance, for which purpose a pair of clamps that are kept inside are withdrawn, and the small points inserted in fulcrum holes one on each side, which latter are placed at such a distance that the case will be in equilibrio when balancing the gauge box and a genuine coin.

Forcing Down Lids of Boxes.

A new contrivance for the above-mentioned purpose has been invented by George W. Wight, of New York City, who has taken measures to secure a patent. It is an apparatus intended for the use of packers, to force down the lids of boxes when they are to be fastened by screws or nails. It consists of a vertical screw working in a nut, which is formed in a cross-piece. Attached to this latter are a couple of bent arms which swing freely, and to the end of the screw is fixed an iron plate which bears on the top of the box, or rather on a stout board that rests on the lid. It will be perceived that, by turning the screw, the cross-piece will commence to rise, when the bent arms will catch on the sides of the box, and the screw will consequently be forced against the lid, and the latter yielding to the impulse will close on the box.

COMPRESSED-AIR RAILROAD BRAKE---Figure 1.

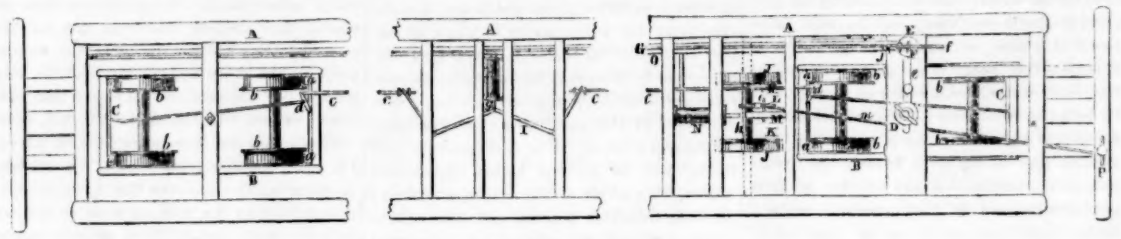
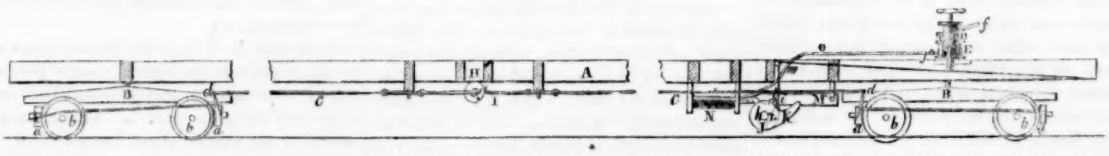


Figure 2.

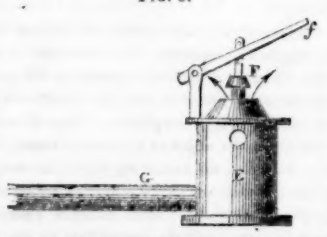


The annexed engravings represent an improvement on Railroad Brakes, invented by Abner Cutler and Jackson A. Rapp, of the city of Buffalo, N. Y., who have taken measures to secure a patent for it.

Figure 1 is a plan view of a car truck with the improvement applied to the brakes. Fig. 2 is a side elevation of fig. 1, the side of the truck being removed. Figure 3 is a detached view of a "receiver" provided with a valve. The same letters refer to like parts.

An air pump is employed to be worked by the locomotive, which forces air through tubes the whole length of the train, and operates pistons in cylinders, which act upon levers that operate the usual brakes. A is a car bed and B B are trucks attached to it. C C are common brakes on the trucks; they have shoes, *a*, which are made to bear against the face of the wheels, *b*, by means of the rods, *c*,

Fig. 3.



and levers, *d*. D is an air-pump placed in any convenient position, and worked constantly by the locomotive when it is in motion. A tube, *e*, fig. 1, passes from the air-pump and leads into a receiver, E, which is provided with a valve, F, at its upper part, as shown in fig. 3; this valve is operated by a lever, *f*. A tube, G, passes from the receiver, along the whole length of the train; the tubes of the several cars are connected by joints of some flexible material, such as vulcanized india rubber; each car has a separate tube; the several tubes, when united, form a continuous one the whole length of a train. H is a cylinder communicating with tube, G; there is a like cylinder for each car. Each cylinder has a piston inside, which is moved to one end, when air is admitted; *g* is the piston rod; I is a system of jointed levers, the piston rod, *g*, acts against them. A toggle joint is placed under the centre of each car bed, and is connected to the ends of the rods, *c*, of the brakes, The manner in which the brakes are operated will be readily understood by what has been said.

The air-pump, D, it will be recollected, is kept constantly working while the locomotive is in motion, and air is forced through the tube, *e*, into the receiver, E. The lever, *f*, of the valve, F, is arranged by any suitable means, so as to be kept elevated, and the air then passes out. When it is necessary to apply the brakes, the lever, *f*, is depressed by a brakesman or engineer, and the valve is then closed, consequently the air is forced by the air-pump, D, into the tube, G, and as the cylinder, H, communicates with the tube, G, the piston in the cylinder is forced out, and the rod, *g*, acts against the toggle joint, I—the toggle joint drawing the ends of the rods, *c*, nearer to each other, and forces the brakes, *a*, against the faces of the wheels, *b*. When the brakes have been applied a sufficient time, the brakesman or engineer withdraws his hand from the lever, *f*, which rises, and the air then passes from the receiver through the valve, and the springs of the brakes throw the toggle joints back.

Another brake arrangement is represented in the front trucks of figures 1 and 2, to cause instantaneous stoppage of the cars; J J are two shoes on an axle, *h*. The shoes are in line with wheels *b b*, and directly over the rails; they are of circular shape and have horns, K. There is a half pulley, L, attached to the middle of axle *h*; it has a pin, *i*, passing through it, which, when the horns, K, are elevated catches into a recess, *l*, on a lever, M, directly over the half pulley. By means of the half pulley and pin, the horns are prevented, when not required, from falling upon the rails. These shoes are operated in the same manner as the brakes previously described. N is a cylinder provided with a piston, and communicating with the tube, O, which is connected with the receiver. The tube, O, has a stop-cock, *j*, in it near the receiver; this cuts off communication with the receiver, when the brakes, C, previously described, are applied. But when it is necessary to stop the cars instantaneously, in case of obstructions on the rails, the stop-cock, *j*, is turned to let the air into the tube, O, the lever, *f*, of course being depressed at the same time. The air then acts on the piston in cylinder, N, its rod, *k*, is forced outwards, and the lever, M, frees the pin, *i*, from its recess, *l*; the horns, K, then drop down upon the rails, and by their great friction arrest the progress of the cars. The tube, O, may be continued the whole length of the train in the same manner as tube G. These shoes are elevated by a chain, *m*, the end of which is attached to the periphery of the half pulley, and the other to the winch P. By turning the winch, the half pulley is turned, and the horns, K, are elevated, the pin, *i*, catching into the recess, *l*, in lever, M. When the horns are elevated, the winch is reversed and the chain slacked, when the shoes are ready for instantaneous operation.

More information may be obtained by letter addressed to the inventors.

Register for Clocks.

P. M. Statzell, and J. L. Kucker, of Philadelphia, have taken measures to secure a patent for several improvements in the Watchmen's Register Attachment for clocks. This is a contrivance to render more efficient an apparatus which is used in many large establishments where a night watchman is employed. The system generally adopted is to have a clock so arranged that the watchman, by pushing a pin or by some other similar operation, acts upon a dial, which, upon examination next morning, exhibits a record of his vigilance. The instruments in general use are open to many objections, of which the chief is their liability to be tampered with by an unfaithful officer. To supply a more efficient register, which cannot be altered, is the intention of this patent, and for this purpose several improvements have been introduced. The first is the registering apparatus, which cansists of a dial divided into 24 equal parts, corresponding to the half hours, which are all marked by a numeral, one of which will always be visible through an aperture in the clock dial. The motion of the registering dial is regulated by a ratchet wheel and spring pawl, which are acted upon by a contrivance connected with the clock-work, and so adjusted that, at the end of each half hour it assumes a vertical position and on a lever being moved by the watchman, it imparts motion to the ratchet-gear and registering dial, which is thus made to rotate and exhibit another numeral through the aperture already mentioned. Should the watchman have neglected to visit the clock at any of the half-hours, it is possible that, to avoid detection, he might seek to turn the register more than one division at his next visit, this fraud is prevented by an arrangement, which holds the ratchet click in its place (after it has passed over one tooth of the ratchet wheel) until the watchman's lever can no longer affect it. Another improvement is in the manner by which it is rendered impossible to shift the hands of the clock except by the authorized person

Scientific American

NEW-YORK, DECEMBER 25, 1852.

Intelligent Mechanics.

From the means which we have of obtaining correct information upon almost every question, we are fully persuaded that we have very few intelligent mechanics in our country in proportion to the amount of population, and their own numbers. We are sorry to say this, but the truth compels us to do it. This should not be, for the means are abundant whereby they can obtain information to make them respected for every mental qualification. The desire, however, must exist in the mind, and it is for the want of this desire—this mental quality—to read good works and study good authors, that so much ignorance abounds.—Instead of reading useful periodicals and books, the great majority of them are delighted with the flashy stories and flippant literature of authors whose names and fame will never reach above nor beyond the very garbage of bookdom.

On our advertisement page there are two advertisements for men capable of conducting two separate trades; the one a practical chemist for dying and finishing woolen goods; the other a practical machinist. We know it is not easy to find a person who has toiled as a hard working mechanic in possession of the means required in the advertisement for the managing machinist, and this is the reason why such an advantageous offer is presented. This very fact should teach our mechanics how much it would be for their own benefit to employ their leisure hours in acquiring useful information, and obtaining such a mastery of their trades as to be able to conduct the same, and thus be ready to ascend to higher situations whenever opportunities like those on our advertising page are presented. We have frequent applications for practical intelligent mechanics who can superintend a business, and we know from experience how difficult it is to obtain them. Every man who works at a trade, no matter what that trade is, should learn it so thoroughly as to be competent to conduct the same in all its branches. Every mechanic should strive to be master of his business. There is philosophy in every trade, and why should not carpenters, tailors, machinists, dyers, millwrights, coopers, &c., be as intelligent as doctors, lawyers, and merchants? There is no use, as many mechanics do, of complaining about the aristocracy of this and that class; it is worse than foolishness; the aristocracy of mind is higher than that of wealth, and always commands respect. A gentleman writing to us some time ago, for a machinist to superintend his foundry and machine shop, said he would give him above $2,000 per annum, but would be willing to give more could he get the proper person. "I want a good mechanic," was his language "and a gentleman, one who is courteous, intelligent, and with whom I can associate as a friend." The elevation of our working men is one object about which we are solicitous; we have often preached about it through these columns, and will continue to do so upon every proper occasion. It has been our object to present a chaste literature along with scientific and other useful information, but our circulation is only among the most intelligent of our mechanics consequently the great mass for whom our remarks of this kind are designed will not see them. We will, however, thank those who do read them to talk upon the subject from time to time with their brother craftsmen, in order that they may feel the force of the old adage, "knowledge is power," and many be led to see the error and foolishness of their ways, and adopt a course of life which will lead them to ascend to the front ranks of Intelligent Mechanics.

Steam Engines.

The engines offered for sale in our advertising columns are worthy the attention of those desirous of purchasing a good article at a rare bargain. It should be remembered that the engines are new and the boilers have not been long used. We attend to the boxing and shipment without any additional cost to the purchaser. Such bargains are not often presented to the public.

The Ether Controversy.---Dangerous Legislation.

We have our regular elections for members of Congress, Senators, and chief officers of the general government. Men are sent to the seat of government to legislate for the welfare of the nation, by making such laws as are necesary for the good of the people, and adopting such measures as will add to the prosperity and honor of the United Commonwealths. It is supposed that these men are acquainted with the wants of the public, and that they will examine every subject legally brought before them, with scrupulous care, and act upon the same in all honesty, without favor, fear, or partiality. Within a few years there has grown up a most dangerous sytem of outer legislation; this is called the "Third House of Congress," and is composed of what are termed "lobby members." Our country must awake to the dangerous influences of this "house," for they are often seductive and unscrupulous. Of this we are fully persuaded by the evidence placed before us respecting the "Ether Discovery," and the attempt that was made to get a grant at the last sesssion of Congress, of $100,000 for its use in the navy, army, and hospitals of the United States. In 1846 Dr. C. T. Jackson, and W. T. G. Morton, dentist of Boston, secured a patent for rendering persons insensible to pain, by inhaling ether, so that surgical operations, such as extracting teeth, amputating limbs, &c., could be performed during the short period of insensibility. By some means it appears that Mr. Morton has obtained the ruling control of the patent, but a certain Mr. Eddy, of Boston has, (at least had) also an active share in it. To compensate Mr. Morton for his discovery, he petitioned last Congress, and the petition was referred to committees in the house and Senate. When Dr. Jackson heard about this attempt of Morton, he hurried to Washington to present his claims. An amendment, however, was tacked to one of the hurried appropriation bills in the Senate which proposed to award $100,000 to Mr. Morton, but this award never was made.

The minority report of the House of Representatives, by the Hon. Edward Stanly, of N. C, and the Hon. Alex. Evans, of Md., the latter a scientific gentleman of reputation completely establishes the fact, as we believe, that Mr. Morton has no just claims to the discovery of etherization. It is an able and strong report, but we cannot agree with some of its conclusions. The claims of Mr. Morton are founded upon having first applied etherization in October 1846, to perform a successful operation on a patient. The claims of Dr. Jackson are not upon having performed the first experiment upon a patient, but in having discovered anaestheia in the winter of 1841 or 1842, by inhaling ether vapor to destroy the injurious effects of chlorine gas, upon his own lungs, which he had inhaled during some of his experiments. The experiment upon himself convinced him, to use his own language, "that he could be rendered *insensible to pain* for some time before unconsciousness took place, and that this state of insensibility of the nerves continued for a sufficient length of time to admit of a surgical operation, and that ether could be safely inhaled into the lungs to an extent before believed to be dangerous." He never, it seems, did perform a surgical experiment with it before 1846, but he communicated his opinions and experience to a number of respectable gentlemen whose testimony is beyond reproach. It is also asserted, and proof is adduced, that he informed Mr. Morton how to make his first experiment, and gave him his first idea of etherization. So far, Dr. Jackson's claims are impregnable; but what constitutes the true foundation to the title of this discovery. The report of the minority says, "no experiments of verification performed by another can take the right of a discovery from him who first formed the *induction*, and prescribed the means of verifying it." By this principle of judging, Sir Humphrey Davy has previous claims. He said, "as nitrous oxyde in its extensive operation, appears capable of destroying pain, it may probably be used with advantage during surgical operations, in which no great effusion of blood takes place." Here is the induction, and we find that in November 1844, about two years previous to the first experiment by Mr. Morton (as directed by Dr. Jackson,) Dr. Wells, of Hartford, Conn., at his own suggestion, had one of his teeth extracted by Dr. Riggs, while under the influence of nitrous oxide gas. From the evidence before us, Dr. Wells was the first person in the world who applied and practised etherization in surgery.

It may be said that nitrous oxyde is a dangerous gas, and the claims of Dr. Jackson will rest upon the safety of discovering sulphuric ether. This is a different question; such a claim would be for the kind of substance used, not the effect obtained beyond its greater safety. By the remarks of Dr. Warren, of Boston, in the November number of the Boston Medical and Surgical Journal, it appears that he does not consider chloroform, or sulphuric ether safe agents, and he prefers a compound chloric ether.

What is it that constitues a true title to a discovery? This is an important question, and one very difficult to settle sometimes.—For example, it is suspected that oxygen is a compound body; this view has been published in the series of articles, Vol. 5, Scientific American, by Dr. Nelson, but as yet it has not been demonstrated. If it should yet be discovered that oxygen is a compound body, who will be entitled to the claim of discoverer? The one who gave the hint which led to the experimental proof, or the demonstrator? The latter surely, but the former deserves his share of the honor also. Upon this principle of reasoning, Dr. Wells' claims to etherization stand out practically the strongest. Dr. Jackson is said to be very cautious, and in this respect not unlike some other discoverers, but if a person has made a valuable discovery, why is he cautious about it, if he has confidence in its merits; At the present day, when the means of establishing honorable claims to new discoveries are so easy, only a few lines published in a proper journal, there is no excuse for any man allowing his claims to be usurped some years afterwards. In this respect we greatly blame Dr. Jackson; if he had acted right, he would have prevented all this trouble about etherization now, all this lobbying at Washington, this great expense to our country, by taking up the time of Congress and committees; and last not least, the proposal of taking $100,000 out of the treasury of the United States to pay one for a discovery made by another. Dr. Jackson has not been well treated, we believe, but we suppose he sees now how his own long silence—in the proper quarter—has been the means of causing so much trouble and expense and heart-burnings in our country, and as we have reason to believe, expense, trouble, and suffering to himself.

Critical Dissertation on Steam, Air, and Gas Engines.

After the successful application of steam to propel machinery, ether, alcohol, and various vapors were proposed as substitutes, because it was supposed that liquids which boiled at a lower heat than water—gave off their vapor then—would economize fuel This opinion was entertained by both scientific and unscientific men, and although Mr. Ainger pointed out this error in an article read before the Royal Society in 1830, the very last number of the Franklin Journal copies an article from the London Chemical Gazette, by J. Apjohn, Professor of Chemistry, Trinity College, Dublin, in which he proves to his own satisfaction that all fluids which boil at a lower temperature than water must necessarily economize fuel if applied as substitutes for steam in propelling machinery. We will point out his error, and in doing so establish the principle that although water does not boil at such a low temperature as many other fluids, its vapor possesses a greater elastic force just in proportion to the heat applied to it.

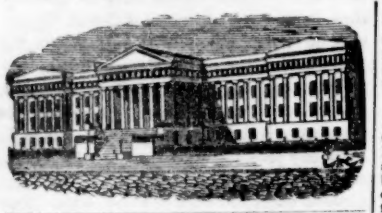
The principle which Mr. Apjohn lays down to prove that alcohol and ether which boil at a lower temperature than water, are more economical in fuel, to exert a force in propelling machinery is this:—"The specific and latent heat of water combined, is 1129·0°, that of alcohol 875·5°, that of ether 534·7°." "The mere inspection of these figures," he says, "is sufficient to show that with alcohol about three-fourths, and with ether somewhat less than one-half the caloric required for water will suffice to produce the same mechanical effect." What reason does he adduce? Here it is, "the vapors of different liquids have at their respective boiling points the same elastic force, equal volumes of them will produce equal mechanical effects." This is a grave error to be propagated by a professor of chemistry; it is not the basis upon which to found any proposition for proving the economy of one liquid over another to produce mechanical effect and we will show why. The mechanical effects of vapors are inversely in proportion to their densities; thus although alcohol floats on water, and ether on alcohol, yet the vapor of water (steam) floats above the vapor of alcohol, and the vapor of alcohol above that of ether. The density of water is 10, alcohol 8, ether 7; the density of their vapors is water 6, alcohol 10, ether 25. M. Cagniard de la Tour put some water into one glass tube, ether into another, and alcohol into another, and hermetically sealed them. By applying heat ether became gaseous in a space scarcely double its volume, at a temperature of 320°, and exerted a pressure of no more than 38 atmospheres; alcohol became gaseous at a temperature of 404½ in a space of thrice its volume with a pressure of 139 atmospheres; water acted on the glass chemically, but by adding some carbonate of soda to it, it becomes gaseous at a temperature of 648° in a space four times its volume, consequently, as an increase of a double volume in alcohol vapor increased the pressure nearly four times, from 38 to 139 atmospheres, the pressure of the vapor of water would be in the same proportion 556 atmospheres; less elastic, according to the pressure to be sure, but under the same pressure there can be no doubt, that according to its latent and specific heat, it would exert a force in proportion over alcohol and ether. Water vapor has 2·5 times more latent heat than alcohol vapor, but the specific gravity of the latter is 2·5 times greater, this shows that the same bulk of vapor will be produced from them both—alcohol and water—with the same expenditure of heat; hence there can be no advatage—no economy in substituting alcohol for water as a source of vapor in the steam engine. The error of Mr. Apjohn lies in taking his deductions from the product—vapor—of heat and a fluid, not from the heat and fluid first. It is the case with too many people, they do not go to the root of the matter, hence their deductions, from laying down a false proposition, may look very plausible, but at the same time be very erroneous. Alcohol, ether, carbonic acid gas, &c., are more expensive and troublesome to obtain than the vapor of water. Some of them would act chemically on the machinery also. They do not possess the quality of being so easily and suddenly condensed as steam, and thus they have not the same qualities to recommend them as substitutes for it. This is the reason why volatile fluids which boil at a lower temperature than water, when applied in engines (and there have been many of such engines,) have always failed to compete with steam. We intended to produce some reasons why hot air engines have also failed to compete with steam, but this we must leave till next week.

To Subscribers.

We have a number of subscribers whose subscription term will expire with our next number (16.) If all subscribers would send in their subscriptions a week or two before they expire, it would save us from sending notices to them of the same, but many, no doubt, forget their dates and numbers, and it is the attention of such which we wish to arrest.—This volume of the Scientific American, so far, has been distinguished above the past, and its future numbers, will, we assure all our readers, fulfil what we have heretofore said of it, of being "the cheapest and best mechanical paper in the world."

Stitching Shoes by Machinery.

The introduction of sewing machines for stitching shoes is becoming quite common. One establishment in Abington, Mass., uses no less than six. It is said that an operator, with the machine, will stitch in a day more than ten times the amount usually accomplished by a "stitcher," and that the cost is very materially reduced. Who, a few years ago, would have thought that our coats and shoes would ever have been stitched by iron fingers?



Reported Officially for the Scientific American

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING DECEMBER 14, 1852

LINING FOR IRON SAFES, &C.—By Wm P. Blake, of New York City: I claim the application of amorphous zinc oxide, as a lining for safes and refrigerators, and as a covering for steam pipes, steam chambers, locomotive boilers, hot air flues, and chambers, in such manner as to prevent the transmission or conduction of calorie, into or from such chambers or flues."

TRIP HAMMERS—By J. C. Forrest & Geo Baker, of Schenectady, N. Y.: We claim the employment of the peculiar-shaped movable tappets of different sizes, the said tappets being arranged loosely on the driving shaft, and moved back and forth, or one substituted for the other by means of the lever, in combination with the hammer, having a rectangular notched or peculiarly formed slot cut in it, the whole being constructed, arranged, and operated in the manner and for the purpose described.

Likewise, so arranging the lever, that when the large or small tappets are moved from one position to the other, or the small tappet made to occupy the place of the large one, the controlling spring will also be operated upon and made to assume a proper position to suit the size of the tappet, the arrangement for effecting this object consisting of a hook-shaped shifter and movable collar, which are constructed, arranged, and operated in the manner set forth.

FIELD ROLLERS FOR CUTTING STALKS AND WEEDS—By Jos. H. Gest, of Batavia, Ohio: I claim the employment or use of the knife roller, said knives being either of straight or spiral form, in combination with the pins and fork, the knives, as the machine moves along, cutting the stalks from the roots, and also the stalks into pieces, while lying upon the ground, and the pins and prongs of the fork drawing the stalks within range of the knives, as specified.

BALL CASTORS—By Robert Hinton, of Roxbury, Mass.: I claim the improvement in making the case of the ball castor, viz., of a combination of two halves or parts, the curved lip, and the ring, as constructed and applied together and to the leg or socket ferrule thereof, as set forth.

STONE PICKS—By J. U. Houston of Conway, Mass.: I claim the addition of a guard to the inner side of the hammer of mill-stone picks, which guard will intercept the chips of stone and protect the hand and person of the picker, using for that purpose the metallic guard described, or any other substantially the same, and which will accomplish the same result.

I do not claim the mode of constructing the pick, as described, in other respects than as pertains to the guard.

BUCKETS FOR CHAIN PUMPS—By Clark Polley, of May's Landing, N. J.: I claim the globular elastic and adjustable bucket, for chain pumps, constructed as set forth.

APPARATUS FOR FRACTURES—By Zimri Hussey, of Chilicothe, Ohio: I claim, first, the hip brace of semi-circular or nearly semi-circular form, and the strap passing over it and around the limb, the said strap and brace operating as set forth.

Second, the knee fork attached either to the upper or lower part of the double inclined plane, for the purpose of attaching a band which clasps the limb, to effect extension or counter extension at the knee, as explained.

Third, the application of the adjustable braces to the crests of the ilium, substantially as described, the said braces being attached to a seat piece, or its equivalent.

Fourth, the seat, in combination with an adjustable back-piece, attached to two double inclined planes, substantially as described, for the purpose of moving the cripple without changing the adjustment of the splints, for the purpose set forth.

SEED PLANTERS—By Henry Nycum, of Uniontown, Pa.: I claim, first, the construction of the compound grain slide, as described, by which the amount of grain required to be sown is graduated at pleasure, as set forth.

Second, the mitre bar, constructed as described, to raise the apparatus for lifting the drill teeth and throwing the slides out of gear, completely out of the way of the operator, thus allowing him to get at the drill teeth, for the purpose of cleaning them of obstructions, with a facility altogether unknown in machines constructed with a horizontal bar in the rear.

SCYTHE SNATHS—By Abram, Charles & Charles N. Clow, of Port Byron, N. Y.: We claim a scythe or cradle snath, composed of a wrought metal tube, which possesses the advantages of great durability and facility of being bent into any desired form, without increasing its ordinary weight, or impairing its usual strength and firmness.

Also the longitudinal rib or its equivalent, on the snath, in combination with a series of notches in the ring of the web, for the purpose of adjusting the webs securely upon the snath, substantially as set forth.

STRAW CUTTERS—By Joel Dawson, of Barnesville, Ohio: I claim, in combination with the rake and spring, the pressure piece and roller, constructed and arranged as set forth.

MACHINERY FOR FORGING METALS, &C.—By Wm. Field, of Providence, R. I. Ante-dated June 14, 1852: I claim, first, the mandrel or its equivalent, for chucking or griping the metal to be forged, and holding the same in the proper position, and from time to time, changing its position between the reciprocating rollers, in combination with reciprocating rollers, for shaping the metal so held, whose action upon the metal is regulated by a pattern guide, substantially as set forth.

Second, the method of regulating the thickness and shape of the metal being forged, without stopping the rollers or withdrawing the metal therefrom by the simultaneous adjustment of the pattern guides, as described.

APPARATUS FOR CLUB FEET.—By Zimri Hussey, of Chilicothe, Ohio: I claim the side pieces to which are attached the adjustable foot pieces, connected and adjustable to each other, as described, by the back piece, plates, bolts, and slots.

PLOW REGULATORS—By Harvey Sprague of Riga, N. Y.: I claim the combination of the arms with the connecting and regulating bar, the arms and the connecting bar forming an arch and working on an axis which passes through the beam, in the manner and for the purpose set forth.

SPIKE MACHINES—By P. P. Trayser, of Baltimore, Md.: I do not confine myself to any particular form or arrangement of the several parts of the machine I have just described, provided the spike is headed and pointed by the mode of operation I have described, as a great number of changes may be introduced into the machine, that will not, in any way, affect the principle upon which it works; indeed, the improvements which I have made could be introduced with advantage either separately or together, into various machines now in use.

What I claim is the combination of the hinged pointing die, pressed forward by a spring, with the guard or stop, or the equivalent thereof, which guides the die and limits its forward movement, substantially as set forth.

SEED PLANTERS—By M. D. Wells, of Morgantown, Va.: I claim the reciprocating bar, having wings projecting horizontally on the front and rear sides of the same, to scoop the seeds in the discharge apertures, arranged and operating in the manner and for the purpose specified.

GRAIN AND GRASS HARVESTERS—By Wm. H. Seymour, (assignor to W. H. Seymour & Daton S. Morgan), of Brockport, N.Y. Ante-dated Oct 25, 1852: I claim the method of supporting the stand for the raker, at the back of the platform, by means of a brace extending to the outer end of the frame, and so arranged as not to impede the action of the rake or the discharge of the cut grain, the several parts being constructed and arranged as described.

Also the method of protecting the gearing of the machine from injury by the working and twisting of the main frame, by mounting the said gearing in a supplementary metallic frame, constructed as described, and rigidly connected to one end of the main frame, upon which it is mounted, as set forth.

SCREW BLANKS—By Cullen Whipple, of Providence, R. I (assignor to the New England Screw Co.) Ante-dated Oct. 16, 1852: I do not claim the broad idea of pointing and chasing the blank in the same machine by different cutters, irrespective of the mechanism employed for the purpose, as I have made such a claim in another specification; my claim on this head is restricted to the mechanism described.

I claim the arrangement of the pointing and chasing tools, on the same tool holder, in such a manner that they are operated by a common motion, as set forth.

CUTTING WHALE BLUBBER—By Lydoriann Ricketson (Admx. of Henry H. Ricketson, deceased), of New Bedford, Mass.: I am aware that in machines for cutting straw, or such like matters, a cutting cylinder has been made to operate on a bed roller, and that the knives on the said cutting cylinder have been arranged in a helix upon it. It is not claimed that such constitutes, in any respect, the invention of the said Ricketson, deceased.

But what is claimed is the wheel, composed of two or more spiral knives, made to rotate on an axis, arranged parallel and in the direction of the movement of the strip of blubber to be cut, as set forth, meaning to claim two or more spiral knives, formed, arranged, and made to operate with respect and in combination with a set of bed and feed rollers, substantially in the manner and for the purpose of cutting blubber as described.

DESIGNS.

BOX STOVE—By James Wager, Volney Richmond, and Harvey Smith, of Troy, N. Y.

IRON RAILING—By N. T. Horton, of Cincinnati, Ohio.

COAL STOVE—By Gilbert Knapp & A. H. Neal, of Honesdale, Pa.

NOTE—In last week's List of Patents, eight of the number issued were obtained through the Scientific American Foreign and American Patent Agency. In the above list five were obtained through the same source, thus demonstrating that, on an average, one American patent issues every day through this Office.

The Patent Office.

The Secretary of the Interior, in his Report makes some excellent suggestions respecting the Patent Office. He says:—

"There is probably no bureau connected with the government in whose operations the public at large feel a deeper interest than those of the Patent Office. It is inseparably associated with every interest of our country. The mechanic, the merchant, the manufacturer, and the farmer, are all concerned in every thing which diminishes the labor of production in any of the departments of industry. Our people are eminently practical and ingenious. They are constantly employed in the discovery of new means of accomplishing important results at a diminished rate of time, labor, and money. The steam engine, the cotton gin, and the magnetic telegraph, are striking and imperishable memorials of the success which has attended their efforts. In the early period of our history, when population was sparse and the prices of agricultural productions high, the labor of the country was directed mainly to the cultivation of the soil. But, as population progressively increases, more attention is devoted to mechanical pursuits and the invention of machinery by which the work of many may be accomplished by a few. Not a day passes without furnishing some evidence of this fact in the form of applications for patents for important inventions and discoveries. The mechanical interest has therefore become one of great magnitude, and it is justly entitled to all the protection and assistance which can be bestowed by Congress consistently with the provisions of the Constitution.

The general principle of our patent system seem to have met with universal approbation, and to have been attended with beneficent results in practice. Since the organization of the office in 1836, it has advanced with rapid strides. At that state one "examining clerk" was enabled to make all the preliminary investigations which were required to ascertain whether the applicant was entitled to a patent; but such has been the increase of the business that six principal examiners and as many assistants are not now able to keep pace with it. The number of models in the office on the first day of January, 1836, was 1,069. In the beginning of the year 1851, they had increased to 17,257, and at the close of the present year they will fall but little short of 23,000. If they should continue to increase in this proportion, making no allowance for the augmentation consequent on the increase of population, by the close of the present century they will amount to 150,000, and the whole of the present Patent Office edifice will not be sufficient for their convenient display. To provide against this contingency, as well as to accomplish other important results, I respectfully propose that the Commissioner of Patents be required to have prepared for publication a careful analytical and descriptive index of all discoveries and inventions which have been patented, accompanied by accurate descriptions and drawings which will fully explain the principles and practical operation of the subject of the patent. The advantages of such a publication would be almost incalculable. It would not only perpetuate the invention or discovery by avoiding the casualities by fire and other causes, but it would multiply and diffuse among the people at large the specifications and descriptions, and substantially bring home to every neighborhood to which a copy of the work might be sent the benefits of the Patent Office. In much the larger number of cases the necessity for preserving and displaying the models would be obviated. The pages of the published report would be a safer and more convenient depository for them than the cabinets of the Patent Office, and they would be accessible to everybody. Inventors in remote parts of the country would be placed on an equal footing with those residing near the seat of Government.—When their thoughts were turned to a particular class of machinery, instead of being compelled to make a journey to Washington to see what had already been done in that department of the arts, they could at once turn to the analytical index and ascertain what progress had been made by others.

The report of Mr. Stansbury on the London Industrial Exhibition of 1851, to which allusion was made in my last annual report, has been delayed by causes beyond his control.—It will be ready to be laid before Congress in the course of a few weeks.

[We like the above; we hope that something of this kind of policy will be carried out for the benefit of inventors. It is now four years since we proposed the same thing, only we thought at the time that the Smithsonian Institute could not do better than perform such a task—an illustrated history of American inventions and discoveries.

With respect to the models, it would please us if Mr. Stuart had recommended that those belonging to rejected applicants should be returned; of what use is it to retain them, they being only duplicates. Some thousands of them are rusting in the Patent Office cellar.

Extension of a Patent.

On the petition of Elizabeth Otis, administratrix of Wm. S. Otis, deceased, praying for the extension of a patent granted to him on the 24th of February, 1839, for an improvement in the Crane Excavator, for excavating and removing earth, for seven years from the expiration of said patent, which takes place on the 24th Feb., 1853.

It is ordered that the said petition be heard at the Patent Office on Thursday the 17th of February, 1853, at 12 o'clock M.; and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specifically set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing, must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

S. H. HODGES, Com. of Patents.

Washington, Dec. 12, 1852.

Recent Foreign Inventions.

GAS RETORTS—John Suarbrick, of Blackburn, Eng., Patentee.—The inventor takes clay as dug from the pit, and if it contains coal or other refuse, burns it until the coal is reduced to ashes; or if no coal exists in the clay, then he mixes the ashes with it, or other varieties of clay, until a suitable material for his purpose is obtained. He then grinds this with just such a quantity of water as will produce a stiff doughy mass. Having taken a mould of the size required (and which should be made in sections) and placed it in an upright position, he introduces a core-bar into it, wedging it firmly into the centre. The stiff clay is then rammed into the spaces between the mould and core, the wedges are withdrawn, and their spaces filled up with clay. The core-bar is then raised by a lever, and another section of the mould united to the first, the same operation being again repeated until the retort is fully moulded. The retort thus moulded is dry enough to be taken at once to the oven and baked. Retorts made of Stourbridge clay are much superior to those made of iron, for making gas.

COMBING WOOL.—S. C. Lister, of Manningham, England, patentee.—The gill-fallers are simply made of much narrower dimensions than usual—about from one-fourth to one-eighth of an inch. Small portions of the material can be operated upon at once, and less oil, it is stated, is required. He also combs cotton on fine combs.

MACHINE FOR DETERMINING A SHIP'S LONGITUDE—John Moore, of Arthur's Town, Wexford, Ireland, patentee.—This instrument consists of two graduated brass circles intersecting each other, and a third circle equatorial to these two. The position of these circles is capable of being adjusted with reference to each other, and they are used in combination with a fourth circle, also graduated, which forms a great circle to the skeleton globe composed of the intersecting circles mentioned. The modes of using these circles vary with the nature of the particular position requiring to be solved.

SUBSTITUTES FOR SUSPENDERS, &C., IN CLOTHES.—J. Saillant, of Paris, tailor, patentee. He inserts into certain parts of articles of dress, such as pantaloons, vests, coats, &c., strips of india rubber, by which a good fit of the garments is secured and they thus are retained in their proper positions without the aid of straps, &c.

REFINING GOLD AND PRECIOUS METALS.—A. Parks, chemist, of Pembrey, Wales.—For separating gold, which is mixed with auriferous earth, it is first smelted with lead and the usual fluxes, and the compound thus resulting is melted, with the addition of one per cent. zinc to every ton, which contains ten ounces of gold. The zinc is added when the compound is in a melted state, and at about the temperature of molten zinc. After stirring so as to insure all the gold being taken up, the mixture is allowed to cool, and the zinc and gold are found in combination. The gold is separated from the zinc by an acid.

VACUUM SUGAR PANS.—J. Walker, of Wolverhampton, Eng., patentee.—The improvement consists in introducing into the body of the vacuum pan a series of vertical tubes, through which steam is admitted to facilitate the operations of evaporation and crystallization. The tubes are enclosed within a cylindrical casing between the sides of the pan, a vacant space is left. This arrangement causes an upward current of the solution in the pan, at the centre of the series of tubes, whilst a gentle descending current is produced between the cylinder and pan, by which compound motion the contents in the pan are prevented from burning.

COATING THE INSIDE OF TUBES—John J. Russell, of Wednesburg, England, patentee.—This improvement simply consists in coating the inside of iron tubes with successive coatings of gutta percha in a state of solution. The coating is laid on with a brush or by pouring in the solution.—[Condensed from the "London Mechanics' Journal," "Expositor," &c.

TO CORRESPONDENTS.

"Western New Yorkers"—There can be no doubt of a general disappointment in respect to the conduct of the American Institute regarding the Ray Premiums. We have received a great number of communications on the subject, but have declined to publish them owing to the absence of pointed facts and straightforward statements. We cannot agree with you about "the high character of the Institute."

F. V., of Mich.—We think it not best to mention your improvements in our columns.

F. R. B., of Ill.—The "Gilder's and Painter's Companion" is a small book; cost $1, postage about 25 cents, it is a very good work. John S. Taylor, 143 Nassau st, sells them.

A. G. B, of Albany—There is not the slightest hope of our being able to furnish you with those back volumes.

J. F. S, of Ohio—We would supply your subscribers with the back numbers with pleasure if we had them, but they are all gone.

J. R. K., of Ga.—Your caveat will take date from the day it was filed, which was on the 11th inst.

H. M. D; of Mass—There is no reliable map of all the railroads built and in contemplation.

B. H. W., of Mo—There is nothing new in your suggesitons about locomotives; essentially the same plan is now in use. We think the improvements you have made in your machine for dressing staves are new and patentable. You are scarcely justified in making an applicatio s for a patent before trying the machine, and even then it is questionable whether you would be able to compete with the simple machinery now in use for the purpose.

W. J T., of Pa.—There is nothing new in your method of gearing locomotive wheels for ascending incline planes; the same thing is in use and is generally well known

S S, of R. I.—We do not know of any patent improvement in the drill which will prevent you from obtaining a patent The peculiar combination you suggest is, without doubt, new and patentable. Balloons are too old for you: don't bother your head about them, as no good would likely come out of your experiments.

C. W B, of Ohio—We have carefully examined the sketches of the four devices you have submitted to us for our opinion, and do not discover sufficient novelty or utility in either of them to warrant application for letters patent. We do not find anything new in either of them. You must study the works on mechanics more thoroughly.

J. W. B, of Tenn.—We have examined the sketch of your so-called perpetual motion. We have no faith in it whatever, and advise you not to waste away your time on a subject so wild and chimerical. We never expect to live to see a perpetual motion.

T. J. H, of Tenn.—There is nothing patentable in your alleged improvement in firemen's ladders.—Substantially the same plan has been invented, and attempts made to bring it into use, but without success.

J. M, of N. Y—We sent you the premium money (3 twenty dollar gold pieces) by the American Express Co, last Saturday.

L. A. M., of Vt.—We shipped the Encyclopedias to you by Express, last Friday week.

J. S., of Md.—A stereotype of the Crystal Palace was sent to you last Monday.

A. R., of Pa.—Yours will receive attention.

A. L. S., of N. Y.—The privilege which A granted to B and C is covered by the written agreement, nothing more and nothing less, except what may have been given before witnesses verbally It is an agreement—a bargain—B and C have no right to transfer nor give away, when it is so stated in the bond of agreement; we believe that the introduction of a new partner who manufactures, is an infringement of the agreement.

Money received on account of Patent Office business for the week ending Saturday Dec. 18:—

S. R. & H., of N. Y., $44,65; S. B, of Ind., $25; J. McM, of Ky., $50; C. & R., of Mass, $30; E. B., of R. I., $30; L. B. F., of N. Y., $25; J. W. T., of Tenn., $30; J. H., of N. Y., $30; H. F. R, of Pa, $31; E. L. N., of Mass., $55; W. McB, of Ohio, $30; C. S. B., of L. I., $20.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Dec. 18:

S. B., of Ind.; G. B. D., of Mass.; L. B. F., of N. Y.; S. E. S., of Vt.; R. C. B., of Ill., (2 cases); E. L. N, of Mass.; F. H., of N. J.

A Chapter of Suggestions, &c.

ALL GONE, ALL GONE.—At the commencement of the present volume, we printed 5,000 extra copies, which we concluded would be sufficient for the subsequent demand. It is now but fifteen weeks since Volume Eight was commenced, and to the disappointment of many we are obliged to announce that the entire editions of the first four numbers are all gone, and that we shall not be able to furnish the back numbers to any parties who order after this date. Of Volumes Six and Seven we have a few, complete, left, and have reserved a few sets of Volume Eight, from the commencement to supply those who have ordered and paid for the volume, but who prefer receiving it at the end of the year.

PATENT CLAIMS—Persons desiring the claims o any invention which has been patented within fourteen years, can obtain a copy by addressing a letter to this office—stating the name of the patentee, and enclosing one dollar as fee for copying.

ADVERTISEMENTS.

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☞ All advertisements must be paid for before inserting.

SCIENTIFIC MUSEUM.

Improvement in the Steam Engine.

A mechanic of this city has constructed and set in motion a steam engine on the novel but obvious plan of working the "inlet and outlet valves" by the direct action of steam, instead of deriving the requisite power from the main agency of a train of working gear, as has been the practice hitherto. The valve-openings are placed in the ends of the cylinder—the valves are those most approved (puppets)—and the working is easy, precise, and rapid to a degree in any other mode of working impossible. In the old modes of working the valves, their motion is continued during the passage of the main piston through the length of the cylinder; in the new mode of working, with the disadvantages incident to their first construction, "the inlet and outlet valves" are fully opened in one twenty-fifth part of the passage of the main pistons through the length of the cylinder, and that so easy as not to be heard when working to an hundred and fifty revolutions per minute. The effect of the new mode of working the valves is to greatly reduce the bulk, weight, and cost of the engine, which is rendered more simple, effective, and durable, and the obstacles to the working of locomotives on common roads are in great part removed.—[New York Tribune.

[So far as the valve openings are concerned, by being situated in the end of the cylinder, this is nothing new, and we can understand it, but how the valves (puppets) are to be operated by the *direct action* of *the steam*, instead of its secondary action, is more than we can comprehend. Some rotary engines work by the re-action of steam like a turbine water wheel; they do not require common or uncommon valves. With respect to the cutting off, plenty of our engines can do this at any part of the stroke. How in the name of all that is sensible in mechanics this engine removes the obstacles to the working of locomotives on common roads, is more than we can imagine, unless the roads themselves are removed. The obstacles are not in the engine—the locomotive—but in the very nature of the roads, and the obstructions to free travel on every public road, which are all happily obviated by the railroad. There have been engines in operation in this city for years, which have no valve rods, nor puppet nor slide valves—no valves at all—but simply ports, which the cylinder opens and closes itself. To talk about working locomotives on common roads when we have railroads, is just about as bright, consistent, and sensible an idea as it would be to advocate lighting up our city with the old oil lamps in place of gas light. Before railroads were in use, the application of steam to common roads was a sensible idea, but even then, after repeated trials in England, and after more than thirty of such engines had been built and tried, they failed to produce any satisfactory results, and when locomotion on railroads was introduced, they all died a natural death.

There are some people, however, who do not know about these things, and whose experience in practical mechanics is so small as often to lead them to impose upon themselves: thus a patent was taken out last year in England, by a distinguished foreigner, for a *horse-power* for railroads, which is just as sensible an idea as steam coaches for common roads.

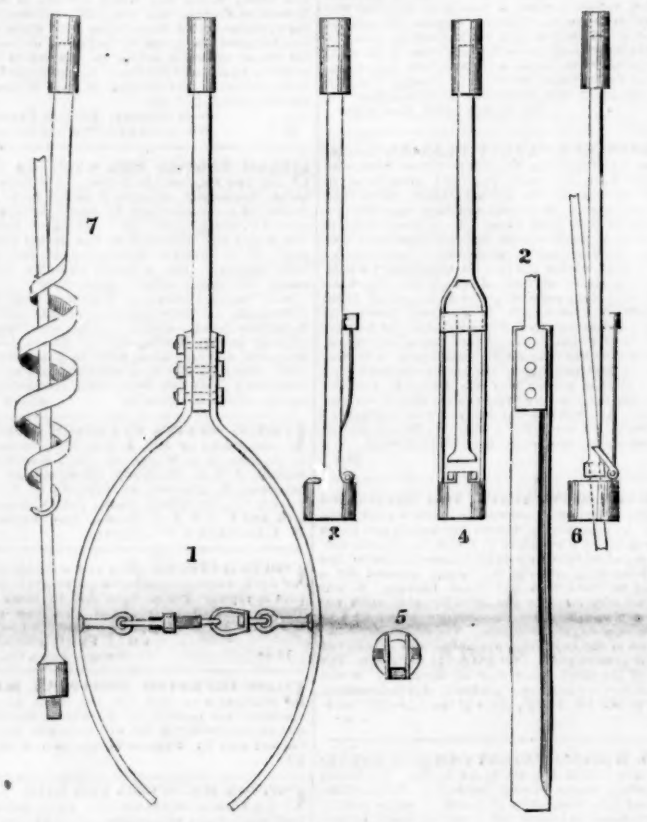
The Fire Annihilator a Fire Propagator.

The Hamilton Spectator tells a rather unfavorable story concerning Phillip's Fire Annihilator. The facts, as narrated by the Spectator are, that in consequence of a fire which broke out on board of the steamship Severn, in August last, during her homeward voyage from the Brazils, the Director of the Royal Mail Packet Company, besides taking other precautions to guard against the awful calamity of fire at sea, ordered a supply of Phillip's patent fire annihilators to be provided for each of their ships. Two were accordingly put on board the Severn, and were kept ready for use. On the outward voyage, we are informed that one of these machines suddenly ignited, and the plug blew out, sending forth such a volume of flame and vapor as was exceedingly difficult to subdue. Water was thrown upon the machine, but this only seemed to increase the offensive fumes, without decreasing the flames. The deck of the vessel was much burnt, and some little damage was done before the fire could be got under. Taking all the circumstances into account, the Severn had a second narrow escape from destruction by fire, inasmuch as if the annihilators had been kept in the store room, (which might have been presumed to be a very natural and suitable part of the ship for their safe keeping,) another and fearful addition to the loss of the Amazon would in all probability have resulted. If this account be true, as we see no reason to doubt, the annihilators should have their name changed at once.

Well Sinking---Artesian Wells.

(Continued from page 112)

Figures 1 and 2, in this plate, exhibit a spring rymer, the cutting edges are placed reversely, and the size is regulated by means of the screw and the swivel. This tool is for enlarging the hole. When the pipes are inserted some distance, it is important that the bore under them should be so far widened as to allow the pipes to be driven further. This tool can be forced down the pipe in a partly collapsed state, springing to its set dimension, as the softer ground under the pipe is cut away. Figs. 3, 4, 5, and 6 show a spring latch tool for raising broken rods; the forked hinge, has a tendency to shut by the action of the spring; therefore, when the tool is forced over the knob of the broken rod, as represented in fig. 6, the spring shuts the forked hinge under the knob, by which the broken rod can be raised. Fig. 7 is a spiral instrument, something like a cork-screw; this is used for the same purpose, when the knob on the rod cannot be easily seized, or when the knob on the weight to be raised will not overcome the friction of the screw. A tool, fashioned like a common lifting pump, is often used for very soft mud—a vertical up and down motion filling the body of the tool with the soft matter. Another useful tool for boring hard substances is a spiral winding round a hollow cone. As the boring goes on the material accumulates in this cone, and may be thus raised to the mouth of the well. Many other tools may be used, and circumstances may require the adaptation of a new tool for a specific purpose in boring. Thus, in boring for the foundation seats of the cast-iron fire-tower in this city, it became necessary to widen the holes at the bottom, in the rock;—this was accomplished by one of the most simple and unique tools we ever saw, which was invented on the moment for that specific object, by Mr. Bogardus—the designer and builder of the tower. It consists of two peculiar-edged claws on one axis, which draw up together, but when dropped down, spread out and excavate a wider hole than that of the general bore. In England a patent was taken out, two years ago, for enlarging a bore at the bottom, for blasting, by employing acid to disintegrate the rock; this plan is troublesome and expensive, because all the acid has to be washed and dried out before the blast is packed; the tool we speak of accomplishes the same object mechanically, with less trouble and at less expense.



Since we penned our last article on this subject the Williamsburgh Water Co. has, it is publicly reported, purchased two ponds of fresh water, at some distance from that city, and this has been done although it had been asserted that a plentiful supply could be and was obtained from the boiling springs, where they have excavated in the lower part of the city. This shows that fears were entertained of future supplies from underground, as the heights of the city came to be occupied by houses.

As all under-ground springs are obtained from water falling from the atmosphere, it follows that a plentiful supply can always be obtained by collecting that which falls in showers. In the latitude of New York, as much water falls every year, in a space of thirty feet square, as will supply an ordinary family. For manufacturing purposes the supply has to be very great, hence factories are always situated on the banks of streams, large springs, or where water is brought from a great distance, as in New York, Boston, &c.

(To be Continued.)

American Fashion and Birmingham Buttons.

The pearl-button trade, in Birmingham, Eng., which has been dull for a long time, has recently received a considerable impetus from some large American orders; this is owing to a fashion which has sprung up in some of our States, for pearl buttons of comparatively large dimensions being worn by ladies, down the front of their dresses. The mother-of-pearl is very high in price just now, owing to the divers having left their avocation, in many places in the Pacific, and proceeded to dig for gold in Australia. The price of the raw material is $680 per ton. The black mother-of-pearl, found in Scotland, is very scarce.

A Patentee and the Bank of England.

The first proceeding under the New Patent Law Act, in England, was the application for a writ to examine a machine, used in the Bank of England, for lettering the pages of books. The applicant was J. Shaw, who made the application, he believing that the Bank of England was infringing his patent, and having requested an examination of the machine was refused. The order for inspection was granted by the Court.

LITERARY NOTICES.

SPEECHES OF T. F. Meagher—Published by Redfield; Nassau street, New York.—Mr. Meagher, the Irish patriot, whose escape from exile was hailed with such enthusiasm by his fellow countrymen, some time since, and who lately lectured on Australia at Metropolitan Hall, has now presented to the American reading public a neat volume of his speeches in Ireland. They are arranged in consecutive order and enriched with notes and explanations from the pen of the eloquent orator himself. His title to this appellation no one can gainsay, for even in reading his speeches manifest extraordinary talent, and when united with the tone and gesture of one speaking evidently from the heart, their effect was undoubtedly omnipotent. Ireland has always been distinguished for her poets and orators, the character of the people being more inclined to the imaginative than the really practical, and to some extent many of her misfortunes are attributable to this cause. The daring impetuous tenor of these speeches, and likewise their poetical flights with so little of the calm dispassionate statesman in their composition, were exactly suited to the feelings of their listeners. Mr. Meagher was the orator, *par excellence*, of the Irish confederates.

THE OLIVE BRANCH—This is a paper that we have been in the custom of taking to our fireside and reading at our leisure for several years. It is not filled with lengthy love-sick profitless stories like too many literary papers, but is well stored with interesting and profitable reading, nearly every article ending with a good moral or imparting some useful hints to some particular class of its readers. A new volume of "The Olive Branch" commences with the new year, therefore now is the very best time to subscribe for it. Address Thos. F. Norris, publisher, Boston, Mass.

BOOK OF THE WORLD—No. 4: Welk & Wieck, Philadelphia.—An entertaining number with three capital engravings—a Highland scene in Scotland, and two colored plates to illustrate natural history. The publisher keeps to his word, and fulfils all that he promises in his prospectus. This is an important point, for we have known many works brought out in numbers to be sadly deficient in quality after the first two or three.

WATER CURE JOURNAL—Vol. iv. No 6; Fowler & Wells, New York.—The recent number of this Journal is fully equal to its predecessors, and contains a vast amount of readable matter; it is also a very cheap periodical and ably edited. As the organ of the Hydropathic party, it is not very indulgent to the other schools of medicine, at which it gives some hard pokes at times. "Who shall decide when doctors disagree?"

PHRENLOGICAL JOURNAL—Ditto—This is another serial by the same enterprizing publishers, who are fully deserving of all the success they meet.

CHRONOLOGY OF THE AMERICAN STAGE—This is a new book, by Francis C. Wemyss, of the American stage also, and published by Wm. Taylor & Co., 151 Nassau street, N. Y. It gives a short sketch of every actor and actress that have appeared on the American stage; it is quite pithy in some of its remarks, and is very entertaining.

MIFFIN'S MECHANICAL DRAWING BOOK—No. 2 of this excellent work is for sale by Dewitt & Davenport, 156 Nassau street, this city. No young mechanic can find a shadow of an excuse for not purchasing this book.

THE CAVALIERS OF FRANCE—This is a very neat and thrilling volume, by H. W. Herbert, so famous for such works, and published by Redfield, 110 Nassau st., this city: it contains the legend of Hugues de Coucy; the tale of Eustache de St. Pierre; the Fortunes of the Maid of Arc—the heroine of romance; and the heart-throbbing tale of Claud Hamilton, or the Massacre of St. Bartholomew.